

ABSTRACT OF THE DISCLOSURE

A multilayer brazeable metallization structure for diamond components and method for producing it are described. The brazeable metallization finds particular application for the attachment of diamond components such as heat spreaders in electronic packages that incorporate high power semiconductor devices. In the present invention, a diamond component is provided with a multilayer coating of metals including a first layer of chromium for adhesion, a second barrier layer of a refractory metal for a barrier that may be alloyed with chromium, and a top layer of copper, silver or gold for wetting. This top layer is thick (greater than 5 microns), without sacrificing resistance to delamination, particularly at brazing conditions. The refractory metals for the second layer include tungsten, molybdenum, tantalum and niobium, or tungsten-chromium alloy. This multilayer metallization structure provides a robust interface between diamond and standard brazing alloys which are used to join the diamond to electrical leads or a flange made of metals such as copper-tungsten. The interfacial adhesion between the metallization and the diamond is sufficient to withstand exposure to brazing at temperatures less than or equal to 1,100°C in inert gas atmospheres that may contain hydrogen.